Resembling var. *villosa* but with the leaves only sparingly pilose or glabrate; the new twigs glabrous or merely puberulent or sparingly pilose, becoming glabrate.— Newfoundland to Ontario, south to Connecticut and Pennsylvania.[1] Type: swale, Goose Pond, Newfoundland, July 9, 1910 (*Fernald & Wiegand*, no. 4051, type-specimen in Gray Herb.). Among many other specimens examined the following are characteristic. NEWFOUNDLAND: moor, Whitbourne, August 16, 1894 (*Robinson & Schrenk*, no. 11). QUEBEC: Seven Islands, Saguenay Co., August 3, 1907 (*C. B. Robinson*, no. 688). NEW BRUNSWICK: Grand Manan, 1902 (*W. G. Farlow*). NOVA SCOTIA: dry fields, Truemanville, May, 1883 (*H. Trueman*). MAINE: shelves at 4000–4500 ft., west wall of North Basin, Mt. Katahdin, July 13, 1900 (*Fernald*). NEW HAMPSHIRE: Alpine Garden and Oakes' Gulf, White Mts., June 23 and 29, 1898 (*J. M. Greenman*, nos. 1076 and 1075); sphagnum bog, Jaffrey, August 29, 1898 (*B. L. Robinson*, no. 598). VERMONT: Willoughby, June 9, 1895 (*G. G. Kennedy*). MASSACHUSETTS: clearing in low woods, Walpole, May 19, 1897 (*W. P. Rich*), June 17, 1908 (*J. R. Churchill*). RHODE ISLAND: swampy meadow, North Smithfield, May 30, 1900 (*E. B. Chamberlain*, no. 129). CONNECTICUT: swamp, Killingly, July 2, 1903 (*C. H. Knowlton*); border of Great Cedar Swamp, Voluntown, June 17, 1899 (*C. B. Graves*). PENNSYLVANIA: Naomi Pines, Monroe Co., June 7–10, 1889 (*J. K. Small*). ONTARIO: Mer Bleue, near Ottawa, June 1, 1905 (*Macoun*, Herb. Geol. Surv. Can., no. 66, 467).

THE PASTURE-THISTLES, EAST AND WEST.

E. J. HILL.

IN the summer of 1909 I had an opportunity to examine for the first time in the field the eastern pasture thistle, *Cirsium pumilum* (Nutt.) Spreng., and to compare it with its nearest western relative, *C. Hillii* (Canby) Fernald, the only one of the two species which I have as yet seen in the vicinity of Chicago. The plants of *C. pumilum* were growing quite abundantly on a gravelly hillside pasture that sloped down to French Creek, just below the village of Saegertown, in northwestern Pennsylvania. The time of finding, Aug. 31st, being

[1] Var. *calvescens* may occur in northwestern America but the material at hand is inadequate for definite determination of that point, and, as already indicated by Gray (*Bot. Cal.*), Rehder, and others, seems to differ in some regards from the eastern varieties.

near the close of its floral season, only a few plants remained in flower, though an occasional bud was seen. The greater part, however, were in seed, or, having lost their fruit, were drying up or dying, having accomplished their work as biennial plants. But the most surprising fact was that some of them were still in flower, a few even in bud, indicating a season not yet completed, in marked contrast with the familiar form (*C. Hillii*) at home. For in the neighborhood of Chicago, whether growing in the prairie or in the open parts of the dune region, *C. Hillii* is virtually out of flower by the 25th of July. Most of the plants at this date have already lost their seed, and by the first of August the stems are generally withered and dry. I have found it in flower as early as the 20th of June, and its season may be considered as lasting about six weeks, from the middle of June to the first of August, the plants being at their best during the first ten days of July. As contrasted with that of *C. pumilum*, July–Sept., its season is June–July. It comes into bloom a little later than *C. Pitcheri* (Torr.) T. & G., the earliest thistle to flower here. As the latter is almost confined to dunes close by the shore of Lake Michigan in our region, where the coolness of the water of the lake commonly retards the shore-plants a week or more beyond the time when the same species blossom farther away from the shore, this also is to be taken into account for the earliness of *C. Pitcheri*. I have collected it in flower as early as June 12th. It may also be found with flowers the first part of August, new branches or shoots having started from a stem or root that carries withered or dried stems at the same time. Its season is therefore longer than that of *C. Hillii*, the duration about the same as that of *C. pumilum*, but with an earlier beginning and closing.

Another contrast between the two pasture-thistles, as I found them, is the more branching and somewhat taller habit of *C. pumilum*, and the resulting presence of a greater number of heads on the same individual. One commonly sees no more than three heads on a plant of *C. Hillii*. It often produces but a single large head crowning an unbranched stem 15 to 20 inches high. Occasionally five heads may be found on a more vigorous plant, or even more, particularly when the terminal bud of the main stem has been injured and branches are forced out from below. Nor is it so strongly armed as the eastern pasture-thistle, the prickles usually being weak.

But one of the chief distinctions lies in the roots of the two. This

fact too often escapes attention, it obviously being more convenient in collecting the plant to cut it off rather than to dig it up entire. The specimens of thistle at Saegertown had a tap root, more or less branching or with smaller side roots, the main root tapering downward as properly in a tap root. The roots of *C. Hillii* are fusiform, usually hollow, and connected by a narrow neck-like part with the base of the stem. Sometimes several spring from the base forming an imperfect fascicle, each connected with the stem by a slender neck. I have found as many as five of these to a single stem. An individual with three is figured in the proceedings of the Davenport Academy of Sciences, 8: 287, Pl. 2, 1900. When single the root is generally perpendicular and runs deeply down, so that it is difficult if not impossible to pull it up, since the narrower neck almost invariably breaks off leaving the most characteristic portion in the ground. The plant being a perennial these several stems may be the product of different years, one of them being commonly longer and larger than the rest. As the bud for a succeeding year's growth forms a little beneath the surface, it would be advantageous to send down a new subterranean part to aid in perpetuating the plant.

Though the flowers of *C. Hillii* are normally of a deep shade of pink-purple, they sometimes take on a brighter shade of red or become red-purple, or magenta-like. In such cases a large head two or three inches across becomes very ornamental in character. The bracts of the involucre in this western thistle are very glutinous on account of a dark gland near the tip. But I found on the bracts of the pasture thistle (*C. pumilum*) at Saegertown a more glutinous line than might be inferred from the common descriptions, the bracts being sticky enough to adhere with considerable force to the drying papers and tear off bits of the latter when removed.

The habitat of *C. Hillii* is a dryish soil. It comes under Warming's classification of mesophytic plants, an inhabitant of prairies, meadows and pastures, but with a tendency towards the drier extreme. My first collection of the plant, near the Kankakee river at Waldron, Ill., June, 1870, is labelled as from "dry fields." It was then confounded with *C. pumilum*, as our only pasture thistle. So too at first in the sand region east of Chicago where its distinctness was subsequently observed. It was on the low sand ridges that run somewhat parallel with one another on the old lake bottom, raised but a few feet above adjoining sloughs or ponds, only slightly above the present level of

Lake Michigan. These low sand ridges of beach and shore deposits bear a scattered growth of pines and oaks, and are sufficiently open and sunny to admit a number of the plants common to the drier prairies beyond the limits of the old lake basin. It is these low ridges that characterize the western part of the sand region. In the dune region proper, where the surface is broken by high sand hills enclosing ponds or shallow depressions of moister ground, I have never met with an example of this thistle. This dune area lies mainly east of the new city of Gary, and as the region west of this place is largely used for factories of various kinds and cut up by a network of railroads and switches, the thistle here is likely soon to become extinct. But it fares better south and west of Chicago in the prairie region, where it still occurs in the more rolling parts of pastures and meadows, or in lower sand areas of the drift formation, particularly in railway enclosures fenced off from the surrounding prairie before the land had been touched by the plow. Here it is one of the few native denizens of the prairie that seem able to compete with an introduced vegetation. It may return again to ground from which it had been excluded by cultivation, when this is seeded down for a time for pasture or meadow, and left a few years untilled. It is greatly helped in this by its copious plumose pappus for the wind dispersion of its seeds. It has the additional advantage of early fruiting, some of its seeds maturing in a meadow before the grass may be cut. It thus takes on the character of a pasture or meadow thistle, and grows successfully beside the white and the red clover, timothy, and the most common meadow and pasture grasses of drier grounds, *Poa pratensis* and *P. compressa*.

CHICAGO, ILLINOIS.

NOTE ON DESMODIUM CANESCENS AND HYOSCYAMUS NIGER.

WALTER DEANE.

I HAVE read with much interest Prof. M. L. Fernald's Notes from the Phaenogamic Herbarium of the New England Botanical Club,—I, in RHODORA for September, 1910, and succeeding Notes will be most welcome. They give definiteness to the records and they will stimu-